

We claim:

- 5 1. A propylene homopolymer, wherein, in its separation according to tacticity by first dissolving the polymers in boiling xylene, then cooling the solution to 25°C at a cooling rate of 10°C/h and then, with ascending temperature, separating the propylene homopolymer into fractions of different
- 10 tacticity, either one or more of the conditions that
- i) the fraction of propylene homopolymers which remains undissolved on heating the cooled propylene homopolymer solution to 112°C is greater than 20 % by weight or
- 15 ii) the fraction of propylene homopolymers which remains undissolved on heating the cooled propylene homopolymer solution to 117°C is greater than 8 % by weight or
- 20 iii) the fraction of propylene homopolymers which remains undissolved on heating the cooled propylene homopolymer solution to 122°C is greater than 1 % by weight,
- are satisfied.
- 25 2. A propylene polymer as claimed in claim 1, wherein either one or more of the conditions that
- i) the fraction of propylene homopolymers which remains undissolved at 112°C is greater than 30 % by weight or
- 30 ii) the fraction of propylene homopolymers which remains undissolved at 117°C is greater than 12 % by weight or
- 35 iii) the fraction of propylene homopolymers which remains undissolved at 122°C is greater than 2 % by weight,
- are satisfied.
- 40 3. A process for the preparation of propylene homopolymers by polymerizing propylene at from 20 to 150°C and from 1 to 100 bar in the presence of a Ziegler-Natta catalyst system containing, as active components,
- 45 a) a titanium-containing solid component which is obtained by reacting a titanium halide with a chlorine-free compound of magnesium, anⁱⁿ organic oxide as a carrier, a

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C₁-C₈-alkanol and an electron donor compound by a method in which,

in a first stage, a solution of the chlorine-free compound of magnesium in an inert solvent is added to the inorganic oxide as a carrier, this mixture is allowed to react for from 0.5 to 5 hours at from 10 to 120°C and then reacted, at from -20 to 80°C with constant mixing, with a C₁-C₈-alkanol in at least a 1.3-fold molar excess, based on the compound of magnesium, to give a chlorine-free intermediate, the titanium halide and the electron donor compound are then added to said intermediate, the resulting mixture is allowed to react for at least 10 minutes at from 10 to 150°C and the solid substance thus obtained is then filtered off and washed and

in a second stage, the solid obtained from the first stage is extracted in an inert solvent containing at least 5 % by weight of titanium tetrachloride and is washed with a liquid alkane,

and, as cocatalysts,

b) an aluminum compound and

c) a further electron donor compound,

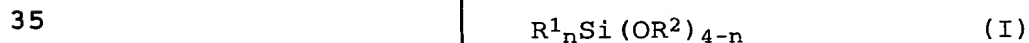
the molar ratio of the aluminum compound b) to the further electron donor compound c) in the polymerization being from 1.5 : 1 to 9 : 1.

4. A process for the preparation of propylene homopolymers as claimed in claim 3, wherein the molar ratio of the aluminum compound b) to the further electron donor compound c) is from 2 : 1 to 8 : 1.

5. A process for the preparation of propylene homopolymers as claimed in claim 3, wherein ethanol is used as a C₁-C₈-alkanol in the preparation of the titanium-containing solid component a) in the first stage.

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6. A process for the preparation of propylene homopolymers as claimed in claim 3, wherein a di-C₁-C₁₀-alkylmagnesium is used as the chlorine-free compound of magnesium in the preparation of the titanium-containing solid component a).
7. A process for the preparation of propylene homopolymers as claimed in claim 3, wherein an inorganic oxide which has a pH of from 1 to 6.5, a mean particle diameter of from 5 to 200 µm and cavities or channels having a mean diameter of from 1 to 20 µm and whose macroscopic volume fraction, based on the total particle, is from 5 to 30 %, is used as a carrier in the preparation of the titanium-containing solid component a).
8. A process for the preparation of propylene homopolymers as claimed in claim 3, wherein a spray-dried inorganic oxide is used in the preparation of the titanium-containing solid component a).
9. A process for the preparation of propylene homopolymers as claimed in claim 3, wherein silica gel is used as the inorganic oxide in the preparation of the titanium-containing solid component a).
10. A process for the preparation of propylene homopolymers as claimed in claim 3, wherein a trialkylaluminum compound whose alkyl groups are each of 1 to 8 carbon atoms is used as the aluminum compound b).
11. A process for the preparation of propylene homopolymers as claimed in claim 3, wherein at least one organosilicon compound of the formula (I)



where the radicals R¹ are identical or different and are each C₁-C₂₀-alkyl, 5- to 7-membered cycloalkyl, which in turn may be substituted by C₁-C₁₀-alkyl, or are C₆-C₂₈-aryl or C₆-C₁₈-aryl-C₁-C₁₀-alkyl, the radicals R² are identical or different and are each C₁-C₂₀-alkyl and n is 1, 2 or 3, is used as the further electron donor compound c).

12. A propylene homopolymer obtainable by a process as claimed in claim 3.

13. A film, fiber or molding comprising the propylene homopolymer as claimed in claim 1.

- 5 14. A film, fiber or molding comprising the propylene homopolymer
as claimed in claim 12.

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